

REMARKS

Claims 1-4 are all the claims pending in the application.

The Applicants thank the Examiner for withdrawing the finality of the previous Office Action and designating the outstanding Office Action as a non-final Office Action.

I. Claim Rejections under 35 U.S.C. § 102(e)

Claim 1 is rejected under 35 U.S.C. § 102(e) as being anticipated by Sawada, et al. (U.S. Patent No. 6,255,678). The Applicants traverse the rejections and request reconsideration.

The Examiner incorrectly contends that the statement in Sawada that a nitride film 48 is deposited to provide water resisting property and pH sensitivity is a teaching for a molecular recognition layer as used in the present invention. The Applicant respectfully submits that a layer that is sensitive to pH is not equivalent to a molecular recognition layer. A molecular recognition layer as used in the present invention recognizes and absorbs specific molecules. On the other hand a pH sensitive layer merely senses pH. In fact, two solutions with different molecules could have the same pH.

In addition, the Examiner incorrectly contends that a teaching that pH at a plurality of positions can be simultaneously measured is equivalent to a molecular recognition layer. The Applicant respectfully submits that the Examiner's contention is an unreasonable stretch. Still further, the Examiner incorrectly contends that the general statement in Sawada that the phenomenon of CCD can be applied to chemical sensing discloses a molecular recognition layer. The general teaching about chemical CCD as in Sawada does not specifically teach a molecular recognition layer as used in the present invention.

The Applicants reiterate that simply sensing pH is not the same as recognizing molecules. Sawada merely discloses a material to select the subject "ion", but fails to show the molecular recognition layer selectively capturing molecules of certain chemical substances. Therefore, Sawada does not disclose a molecular recognition layer as in the present invention as recited in claim 1.

For example, various types of such molecular recognition layers use the relationships between "host"- "guest", "antigen"- "antibody", or "DNA"- "hybridization". Thus, a molecular recognition layer contains a material (substance), which specifically receives particular molecules.

II. Claim Rejections under 35 U.S.C. § 103(a)

Claims 1-4 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hafeman, et al. (US 5,164,319) in view of Marks, et al. (US 6,203,758). The Applicants traverse the rejections and request reconsideration.

The Examiner reiterates that a change in surface potential at the two electrodes of Hafeman as a result of change in composition or concentration of an electrolyte is equivalent to the function provided by a molecular recognition layer. However, the Applicants respectfully submit that the teachings of Hafeman can in no way be construed to be a specific teaching related to a molecular recognition layer. Specifically, in Hafeman, the depth of the potential well does not change in relation to the composition of a molecule as in the present invention.

Further, claim 1 requires that the molecular recognition layer selectively capture molecules of certain chemical substances. Even if the first and second electrodes are construed to be acting like a chemical CCD, as the Examiner alleges, there is no teaching about the molecular recognition layer selectively capturing molecules as in the present invention.

As previously argued, the cited reference Hafeman discloses measuring of capacitance change at "space charge region" that is corresponding to amount of the measurement object (col. 2, line 9). That is, under depletion condition at the space charge region, capacitance change is measured with a fixed voltage frequency applied.

To the contrary, in the chemical CCD device of the present invention, electrical charges are injected to a plurality of potential wells, depth of which is variable in response to chemical quantity. The chemical quantity is converted to the electrical charges corresponding to size of the potential well so that the chemical quantity is measured by the charges. According to the present invention, the accumulated charges are successively transferred and repeated to enhance the sensitivity.

Claims 2-4 are dependant on claim 1. Therefore, the arguments discussed above in relation to claim 1 are equally valid.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

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Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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